

## NISTTech

### Optical Trap for Detection & Quantitation of Subzeptomolar Quantities of Analytes

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#### Description

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Detecting and quantifying small amounts and concentrations (at the subzeptomolar levels) of analytes is made possible with optical tweezers. Analytes that can be detected by using this invention include nucleic acids, antigens and antibodies, receptors and lectins. This technology should find major application for detection of infectious diseases, through the detection of disease specific antigens, antibodies, or nucleic acid sequences. It should also find application in detection of any other component presently detectable through PCR, DNA probe technology or immunoassay but at the level of only a few molecules.

#### Abstract

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Tightly focused beams of laser light are used as "optical tweezers" to trap and manipulate polarizable objects such as microspheres of glass or latex with diameters on the order of 4.5  $\mu\text{m}$ . When analytes are allowed to adhere to the microspheres, small quantities of these analytes can be manipulated, thus allowing their detection and quantitation even when amounts and concentrations of the analytes are extremely small. Illustrative examples include measuring the strength needed to break antibody-antigen bonds and the detection of DNA sequences.

#### Inventors

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#### References

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- U.S. Patent # 5,620,857 issued 04-15-1997, expires 06/07/2015
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#### Status of Availability

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This invention is available for non-exclusive licensing. Collaborative research opportunities are available.

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